

Pantheon Report

Generated at 2018-08-31 07:21:05 (UTC).

Data path: AWS India 1 on `ens5` (*local*) → India on `em1` (*remote*).

Repeated the test of 4 congestion control schemes 3 times.

Each test lasted for 30 seconds running 1 flow.

NTP offsets were measured against `nets.org.sg` and have been applied to correct the timestamps in logs.

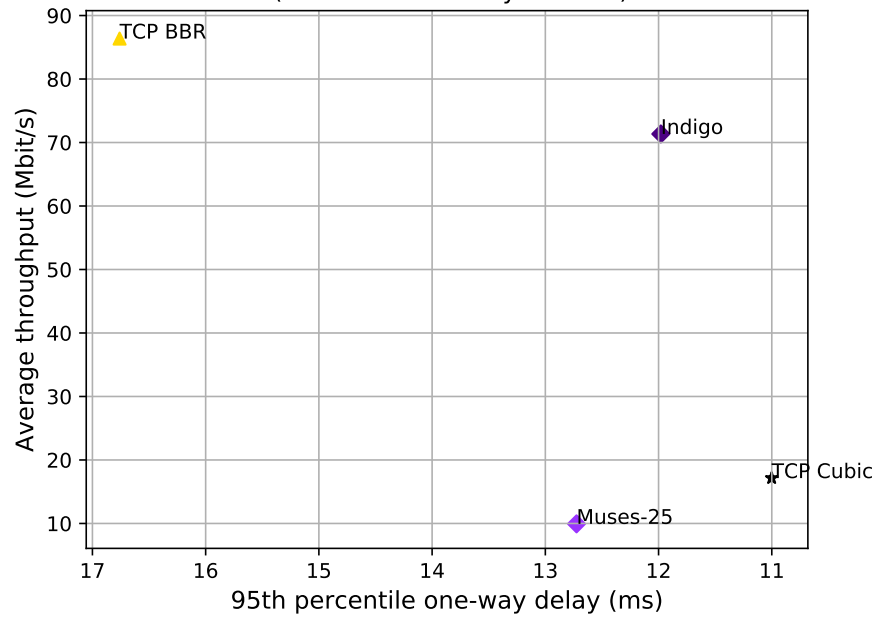
System info:

```
Linux 4.15.0-1020-aws
net.core.default_qdisc = fq
net.core.rmem_default = 16777216
net.core.rmem_max = 536870912
net.core.wmem_default = 16777216
net.core.wmem_max = 536870912
net.ipv4.tcp_rmem = 4096 16777216 536870912
net.ipv4.tcp_wmem = 4096 16777216 536870912
net.ipv4.tcp_mem = 536870912 536870912 536870912
```

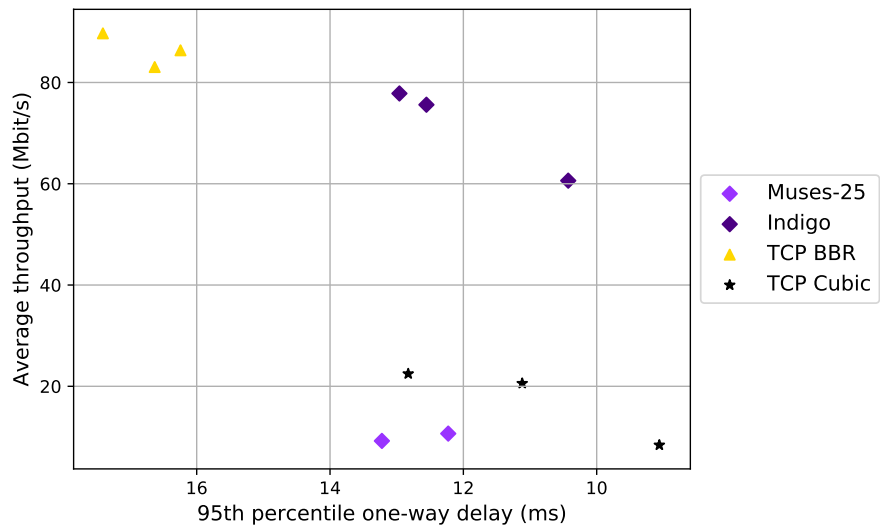
Git summary:

```
branch: muses @ e3c5aa19ca94c3066828fb83f16a8fb6b2731e7a
third_party/fillp @ d47f4fa1b454a5e3c0537115c5a28436dbd4b834
third_party/fillp-sheep @ daed0c84f98531712514b2231f43ec6901114ffe
third_party/genericCC @ d0153f8e594aa89e93b032143cedbdf58e562f4
third_party/indigo @ 2601c92e4aa9d58d38dc4dfe0ecd90c077e64d
third_party/libutp @ b3465b942e2826f2b179eaab4a906ce6bb7cf3cf
third_party/muses @ b59e0d118c50af3579569c462d33045741c85981
third_party/pantheon-tunnel @ cbfce6db5ff5740dafa1771f813cd646339e1952
third_party/pcc @ 1afc958fa0d66d18b623c091a55fec872b4981e1
M receiver/src/buffer.h
M receiver/src/core.cpp
M sender/src/buffer.h
M sender/src/core.cpp
third_party/pcc-experimental @ cd43e34e3f5f5613e8acd08fab92c4eb24f974ab
third_party/proto-quic @ 77961f1a82733a86b42f1bc8143ebc978f3cff42
third_party/scream-reproduce @ f099118d1421aa3131bf11ff1964974e1da3bdb2
M src/ScreamClient
M src/ScreamServer
third_party/sprout @ 366e35c6178b01e31d4a46ad18c74f9415f19a26
third_party/verus @ d4b447ea74c6c60a261149af2629562939f9a494
M src/verus.hpp
M tools/plot.py
third_party/vivace @ 2baf86211435ae071a32f96b7d8c504587f5d7f4
third_party/webrtc @ 3f0cc2a9061a41b6f9dde4735770d143a1fa2851
```

test from AWS India 1 to India, 3 runs of 30s each per scheme
(mean of all runs by scheme)



test from AWS India 1 to India, 3 runs of 30s each per scheme



scheme	# runs	mean avg tput (Mbit/s) flow 1	mean 95th-%ile delay (ms) flow 1	mean loss rate (%) flow 1
TCP BBR	3	86.37	16.76	7.50
TCP Cubic	3	17.15	11.00	0.26
Indigo	3	71.35	11.98	7.85
Muses-25	2	9.94	12.72	3.56

Run 1: Statistics of TCP BBR

Start at: 2018-08-31 07:07:32

End at: 2018-08-31 07:08:02

Local clock offset: -7.235 ms

Remote clock offset: -1.81 ms

Below is generated by plot.py at 2018-08-31 07:21:03

Datalink statistics

-- Total of 1 flow:

Average throughput: 83.05 Mbit/s

95th percentile per-packet one-way delay: 16.630 ms

Loss rate: 9.48%

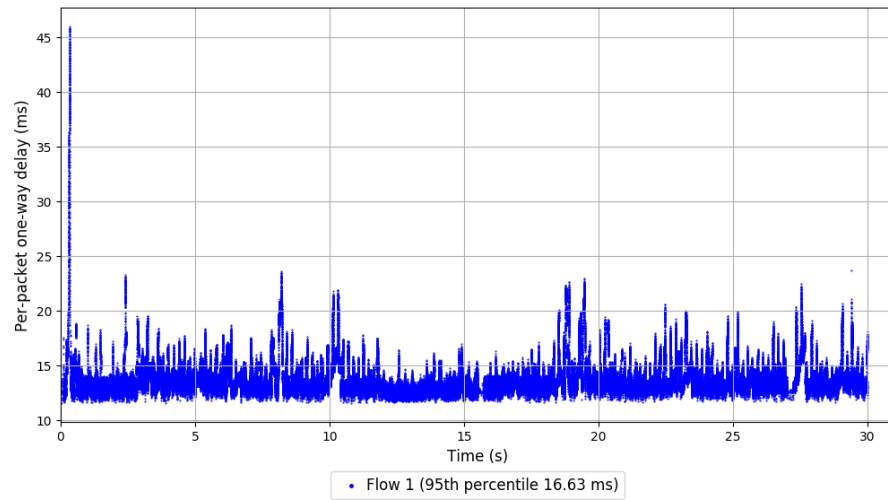
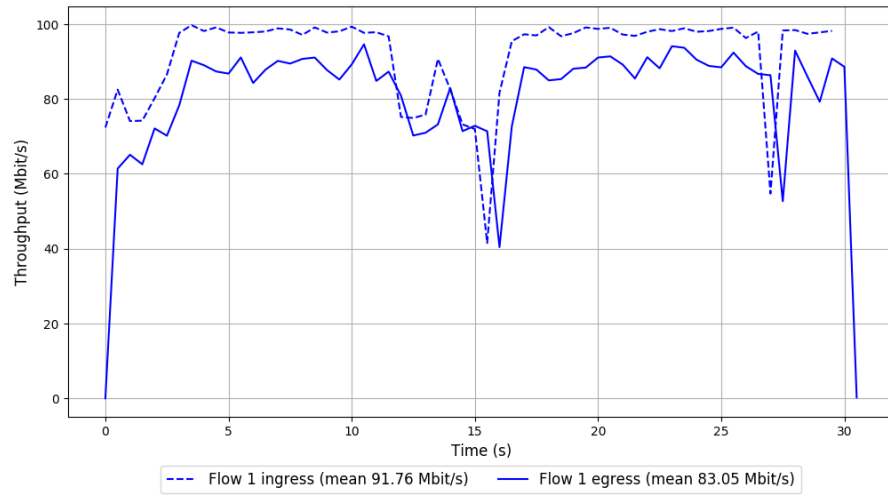
-- Flow 1:

Average throughput: 83.05 Mbit/s

95th percentile per-packet one-way delay: 16.630 ms

Loss rate: 9.48%

Run 1: Report of TCP BBR — Data Link



Run 2: Statistics of TCP BBR

Start at: 2018-08-31 07:12:08

End at: 2018-08-31 07:12:38

Local clock offset: -3.545 ms

Remote clock offset: -0.924 ms

Below is generated by plot.py at 2018-08-31 07:21:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 86.36 Mbit/s

95th percentile per-packet one-way delay: 16.243 ms

Loss rate: 7.45%

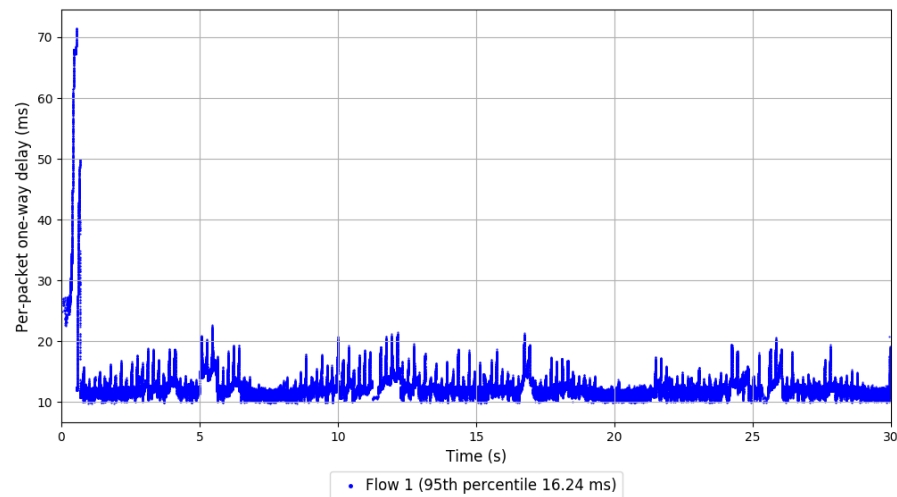
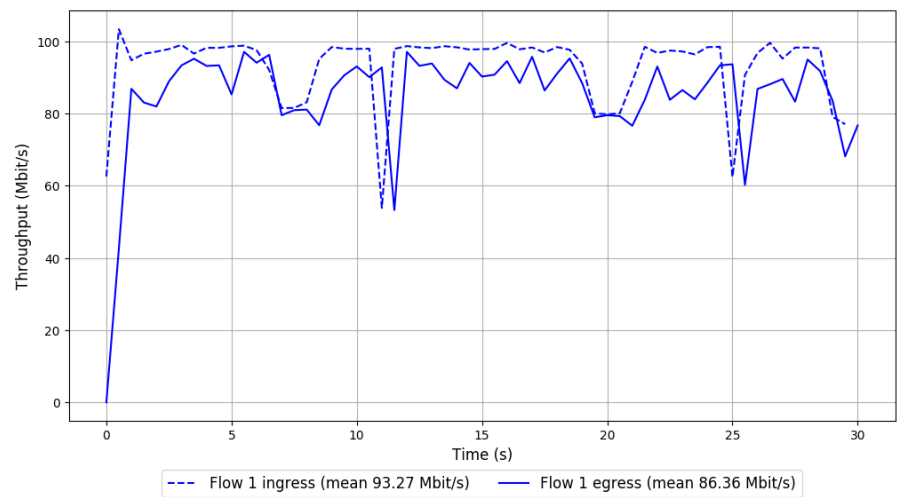
-- Flow 1:

Average throughput: 86.36 Mbit/s

95th percentile per-packet one-way delay: 16.243 ms

Loss rate: 7.45%

Run 2: Report of TCP BBR — Data Link



Run 3: Statistics of TCP BBR

Start at: 2018-08-31 07:16:44

End at: 2018-08-31 07:17:14

Local clock offset: -4.976 ms

Remote clock offset: -2.326 ms

Below is generated by plot.py at 2018-08-31 07:21:04

Datalink statistics

-- Total of 1 flow:

Average throughput: 89.71 Mbit/s

95th percentile per-packet one-way delay: 17.407 ms

Loss rate: 5.58%

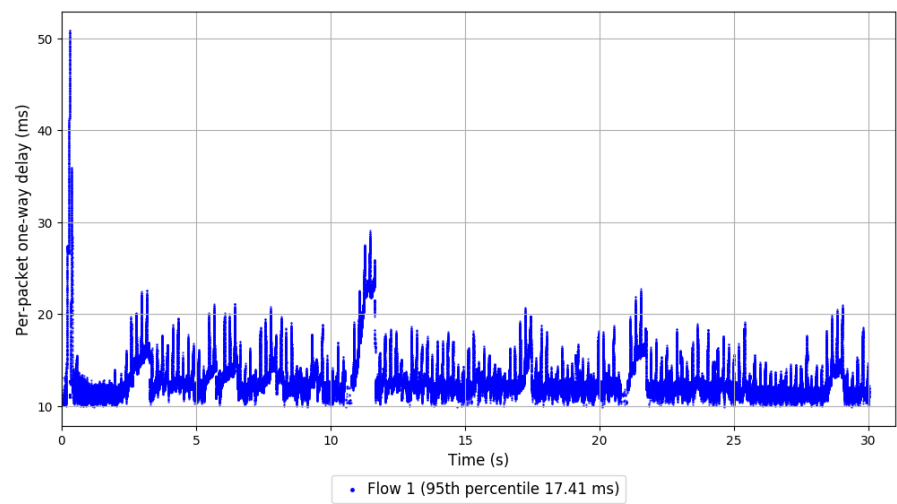
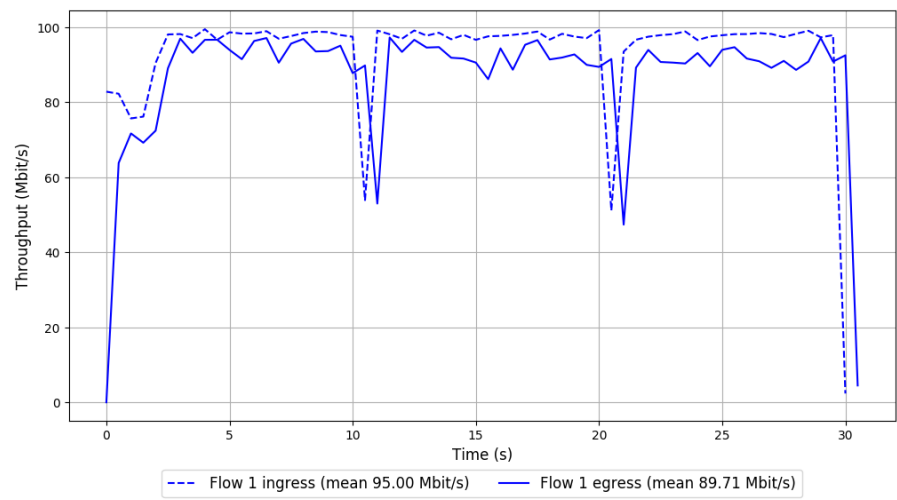
-- Flow 1:

Average throughput: 89.71 Mbit/s

95th percentile per-packet one-way delay: 17.407 ms

Loss rate: 5.58%

Run 3: Report of TCP BBR — Data Link

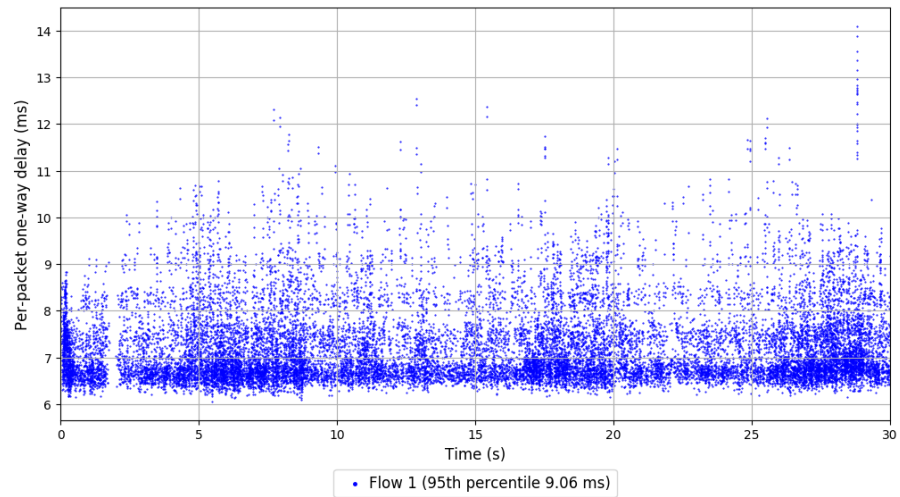
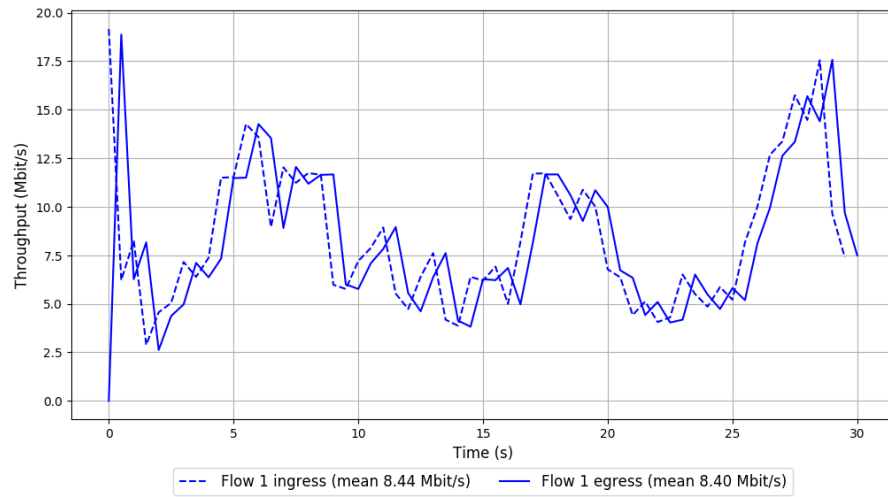


Run 1: Statistics of TCP Cubic

Start at: 2018-08-31 07:08:48
End at: 2018-08-31 07:09:18
Local clock offset: -2.001 ms
Remote clock offset: -2.051 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 8.40 Mbit/s
95th percentile per-packet one-way delay: 9.060 ms
Loss rate: 0.51%
-- Flow 1:
Average throughput: 8.40 Mbit/s
95th percentile per-packet one-way delay: 9.060 ms
Loss rate: 0.51%

Run 1: Report of TCP Cubic — Data Link

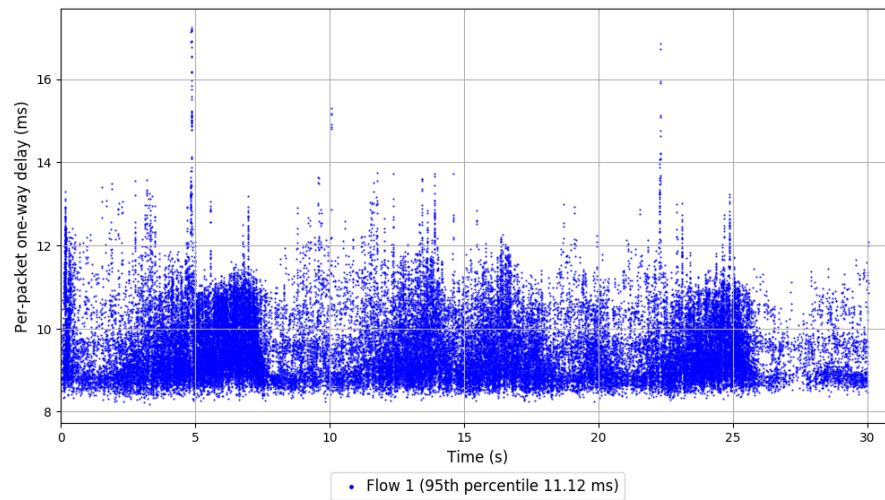
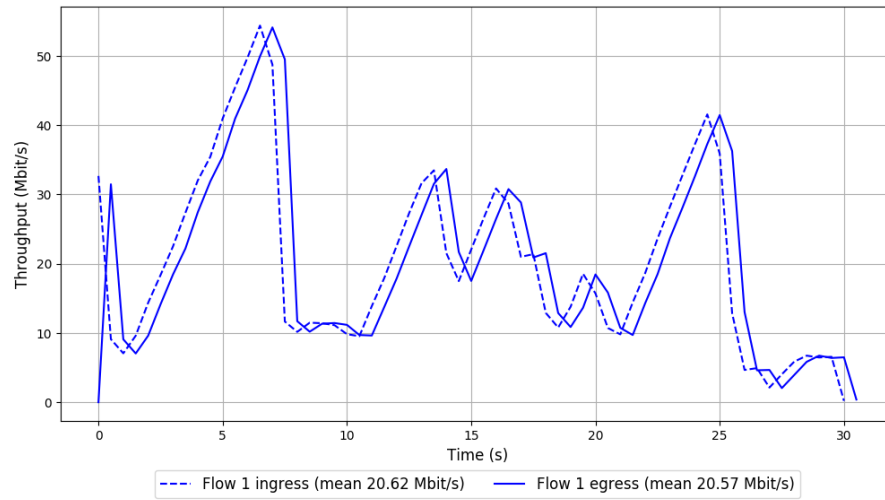


Run 2: Statistics of TCP Cubic

Start at: 2018-08-31 07:13:19
End at: 2018-08-31 07:13:49
Local clock offset: -2.962 ms
Remote clock offset: -1.629 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 20.57 Mbit/s
95th percentile per-packet one-way delay: 11.117 ms
Loss rate: 0.20%
-- Flow 1:
Average throughput: 20.57 Mbit/s
95th percentile per-packet one-way delay: 11.117 ms
Loss rate: 0.20%

Run 2: Report of TCP Cubic — Data Link

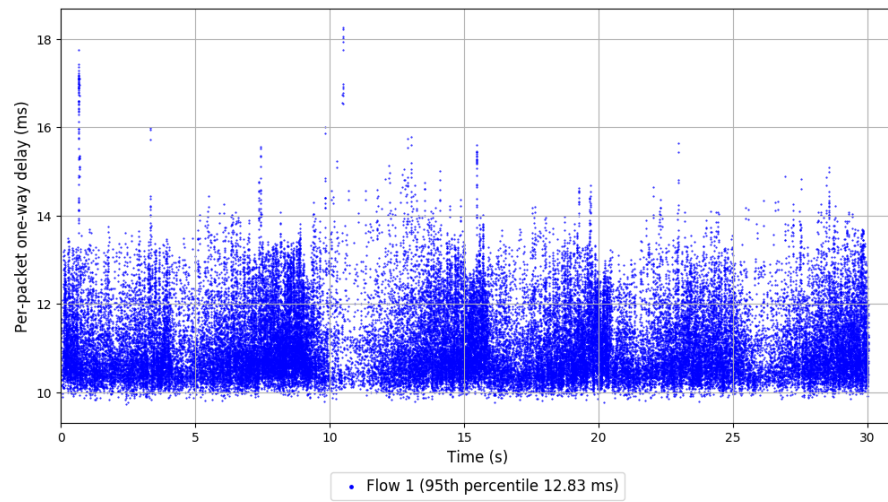
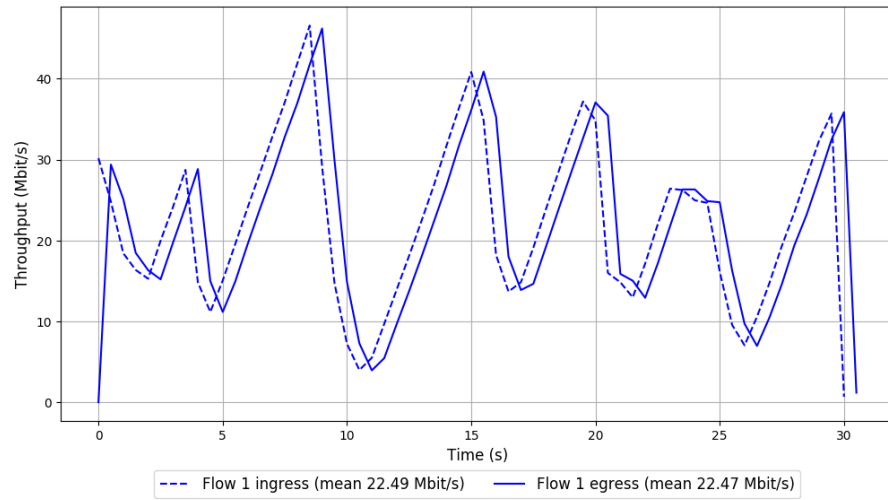


Run 3: Statistics of TCP Cubic

Start at: 2018-08-31 07:18:20
End at: 2018-08-31 07:18:50
Local clock offset: -3.818 ms
Remote clock offset: -1.295 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 22.47 Mbit/s
95th percentile per-packet one-way delay: 12.827 ms
Loss rate: 0.08%
-- Flow 1:
Average throughput: 22.47 Mbit/s
95th percentile per-packet one-way delay: 12.827 ms
Loss rate: 0.08%

Run 3: Report of TCP Cubic — Data Link

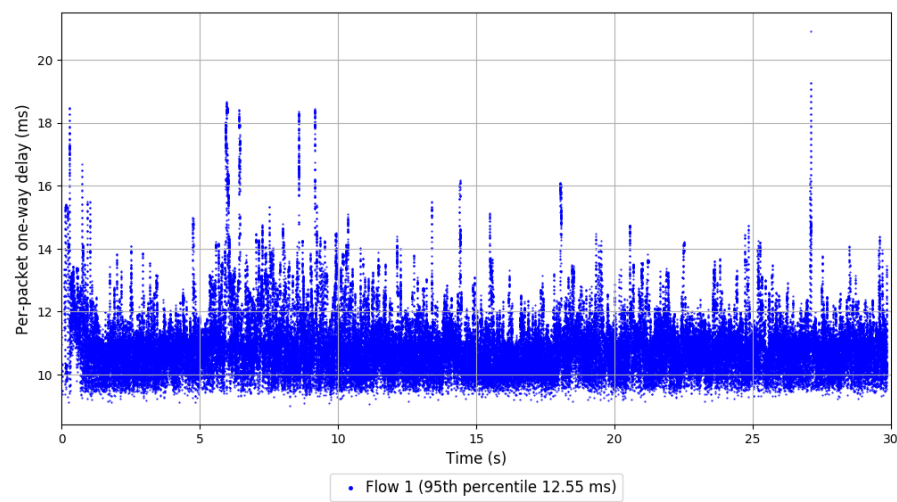
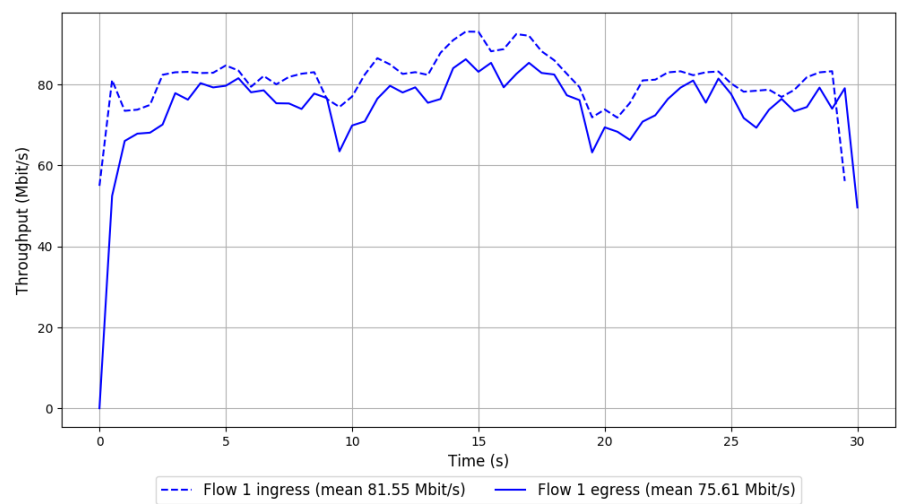


Run 1: Statistics of Indigo

Start at: 2018-08-31 07:09:52
End at: 2018-08-31 07:10:22
Local clock offset: -4.355 ms
Remote clock offset: -1.665 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 75.61 Mbit/s
95th percentile per-packet one-way delay: 12.554 ms
Loss rate: 7.30%
-- Flow 1:
Average throughput: 75.61 Mbit/s
95th percentile per-packet one-way delay: 12.554 ms
Loss rate: 7.30%

Run 1: Report of Indigo — Data Link

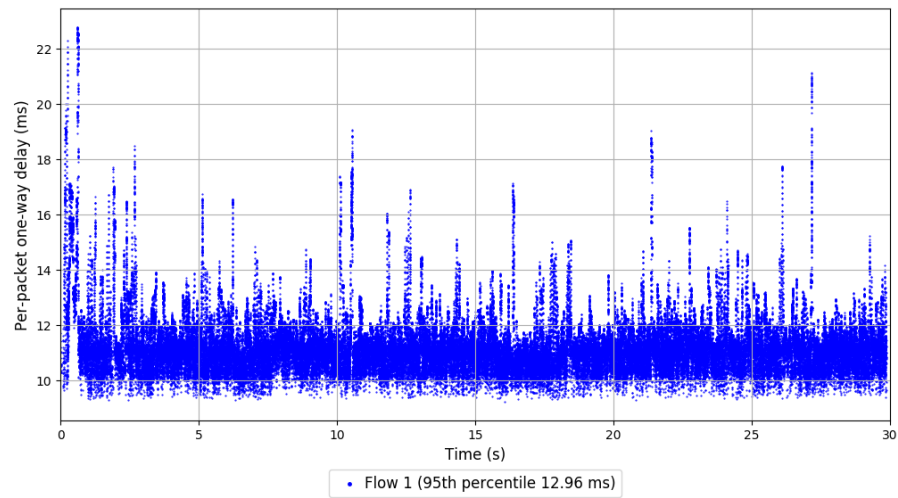
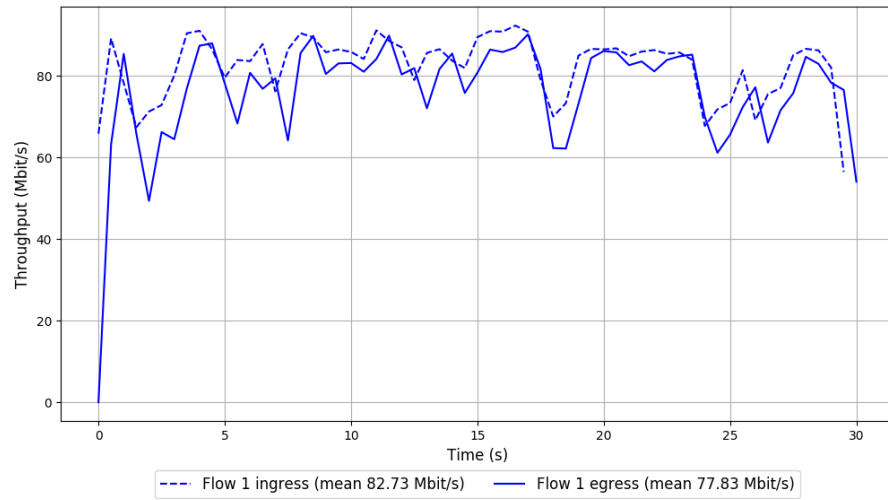


Run 2: Statistics of Indigo

Start at: 2018-08-31 07:14:25
End at: 2018-08-31 07:14:55
Local clock offset: -3.48 ms
Remote clock offset: -1.527 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 77.83 Mbit/s
95th percentile per-packet one-way delay: 12.959 ms
Loss rate: 5.93%
-- Flow 1:
Average throughput: 77.83 Mbit/s
95th percentile per-packet one-way delay: 12.959 ms
Loss rate: 5.93%

Run 2: Report of Indigo — Data Link

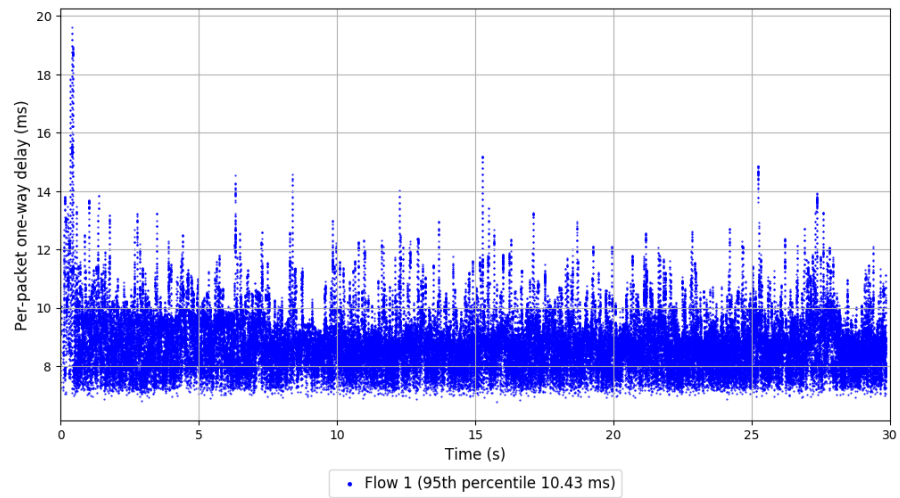
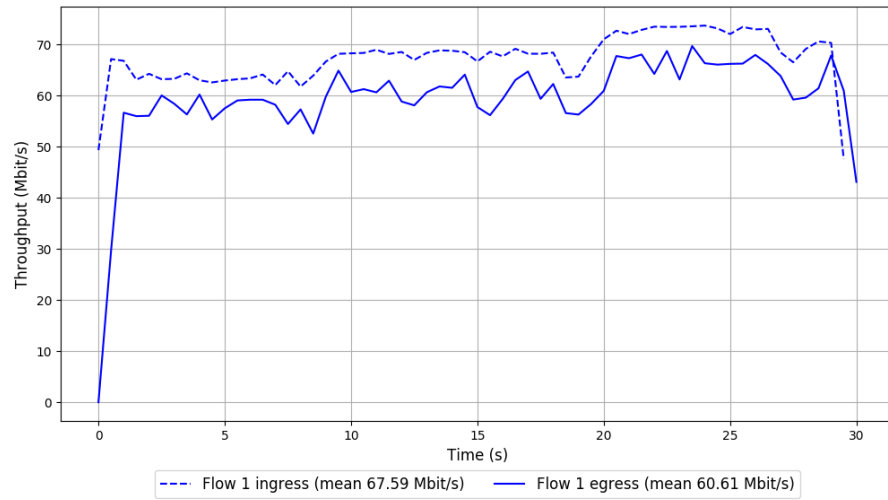


Run 3: Statistics of Indigo

Start at: 2018-08-31 07:19:26
End at: 2018-08-31 07:19:56
Local clock offset: -1.657 ms
Remote clock offset: -2.115 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 60.61 Mbit/s
95th percentile per-packet one-way delay: 10.427 ms
Loss rate: 10.33%
-- Flow 1:
Average throughput: 60.61 Mbit/s
95th percentile per-packet one-way delay: 10.427 ms
Loss rate: 10.33%

Run 3: Report of Indigo — Data Link



Run 1: Statistics of Muses-25

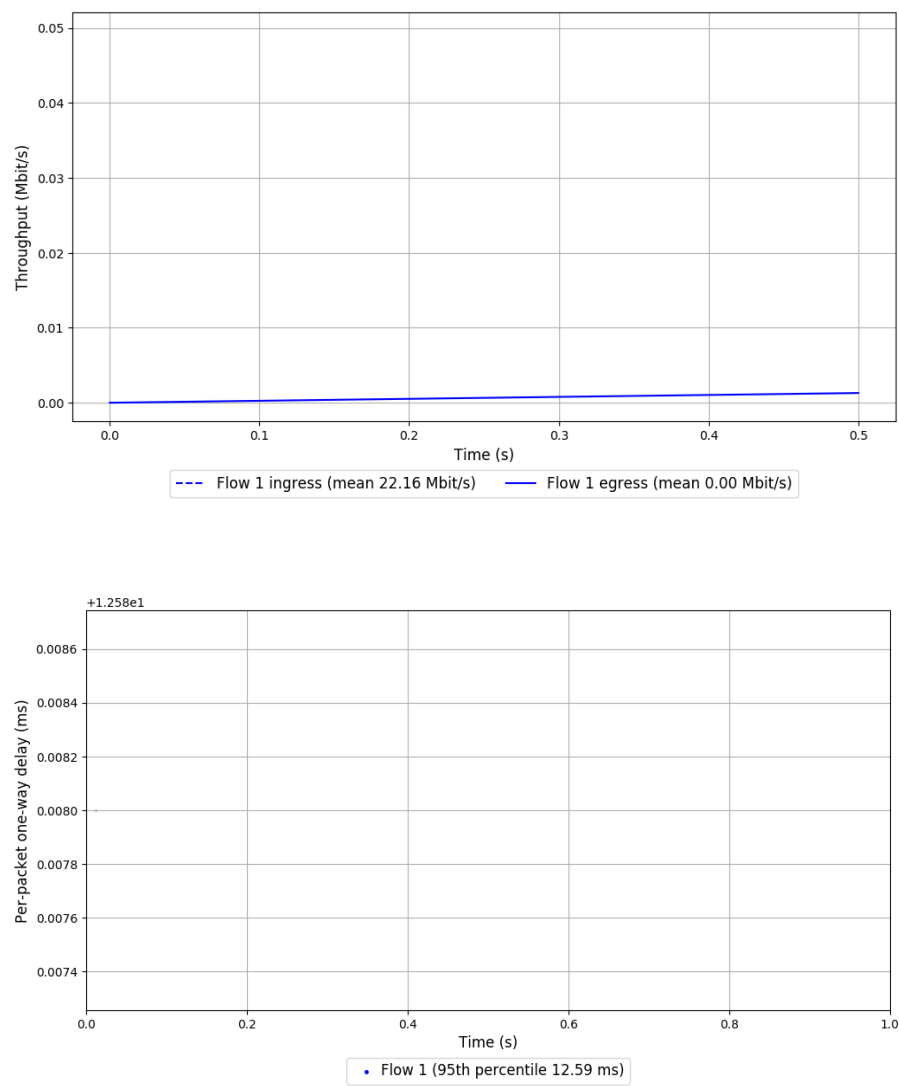
Start at: 2018-08-31 07:06:28

End at: 2018-08-31 07:06:58

Local clock offset: -7.418 ms

Remote clock offset: -0.804 ms

Run 1: Report of Muses-25 — Data Link

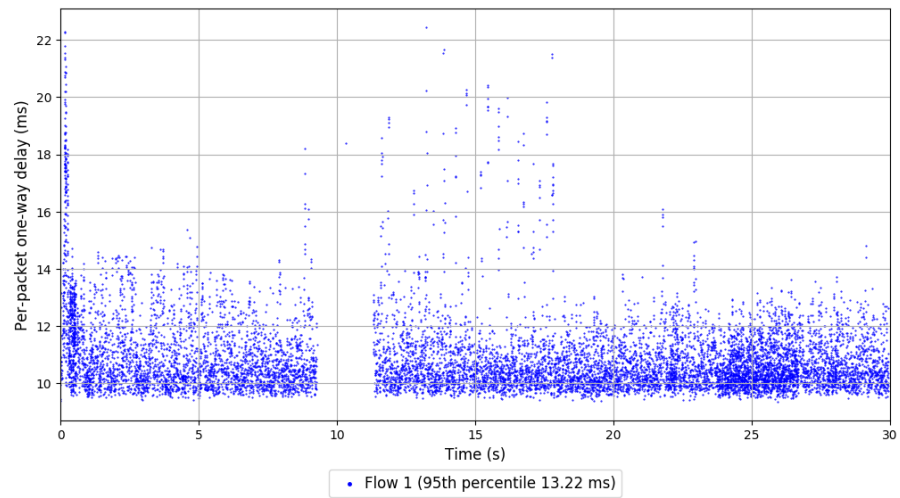
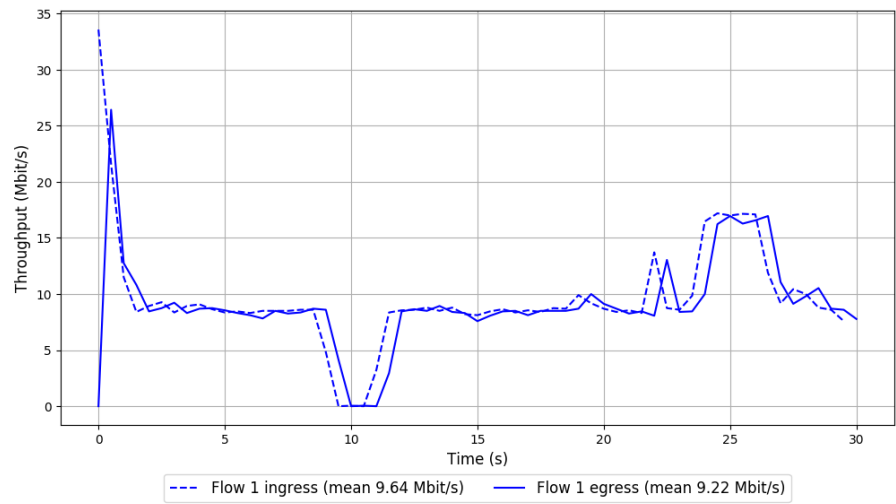


Run 2: Statistics of Muses-25

Start at: 2018-08-31 07:11:04
End at: 2018-08-31 07:11:34
Local clock offset: -4.767 ms
Remote clock offset: -2.557 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 9.22 Mbit/s
95th percentile per-packet one-way delay: 13.222 ms
Loss rate: 4.43%
-- Flow 1:
Average throughput: 9.22 Mbit/s
95th percentile per-packet one-way delay: 13.222 ms
Loss rate: 4.43%

Run 2: Report of Muses-25 — Data Link



Run 3: Statistics of Muses-25

Start at: 2018-08-31 07:15:35
End at: 2018-08-31 07:16:05
Local clock offset: -2.914 ms
Remote clock offset: -1.727 ms

Below is generated by plot.py at 2018-08-31 07:21:04
Datalink statistics
-- Total of 1 flow:
Average throughput: 10.66 Mbit/s
95th percentile per-packet one-way delay: 12.227 ms
Loss rate: 2.69%
-- Flow 1:
Average throughput: 10.66 Mbit/s
95th percentile per-packet one-way delay: 12.227 ms
Loss rate: 2.69%

Run 3: Report of Muses-25 — Data Link

